



ROSE & WESTRA, INC.
ENVIRONMENTAL CONSULTANTS

September 19, 2011

File: 0091.03077.0

Mr. David Latchana
Wolverine World Wide, Inc.
9249 Courtland Drive NE
Rockford, MI 49351



Re: Wolverine World Wide - Former Rockford, Michigan Tannery • Post Demolition
Environmental Investigation

Dear Mr. Latchana:

The following letter summarizing the purpose and results of the environmental investigation performed in Spring/Summer 2011 at the former tannery site, 123 North Main Street, Rockford, Michigan (the Site). We also present a brief description of ongoing additional investigation at the Site.

Site Demolition

Prior to the demolition, WWW retained Valley City Environmental (Valley City; Grand Rapids, Michigan) to clean the process portions of the tannery buildings. Simultaneously, WWW retained R&W to operate the wastewater pre-treatment plant to treat and dispose of water generated during the cleaning process. Valley City characterized and removed remaining process chemicals and waste for off-site disposal. These materials included waste in the former chromium and sulfide reclamation tanks which were located above ground and inside the tannery building. After removing these materials, Valley City power-washed the walls and floors in the process areas of the former tannery building. The resulting water was treated at the on-site wastewater plant and discharged to City of Rockford sewer system in accordance with the pre-treatment permit.

WWW retained Rockford Construction (Grand Rapids, Michigan) to perform a pre-demolition asbestos survey and then demolish the buildings. The buildings were removed to the concrete/brick floors, the floors were then broken to promote drainage. Mr. John O'Brien and other WWW representatives made frequent (daily) observations of the demolition. Clean sand and topsoil were placed over the remnants of the slabs to promote drainage and provide suitable soil for vegetation. Grass seed was drilled into the topsoil and covered with mulch.

During the demolition, Rockford Construction and WWW representatives discovered two areas where WWW determined that soil should be removed as part of the demolition. The first area was located under the former maintenance area near the northwestern corner of the former tannery building. The second area was under the bottom of the former primary clarifier and sludge holding tank in the wastewater treatment plant. The soil in

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these areas was excavated and transported to an off-site, licensed landfill. The excavation in the maintenance area was approximately 50 feet square and 6 to 7 feet deep (refer to Figure 1). The soil from the former primary clarifier area that was removed constituted approximately 10 cubic yards.

Regulatory Framework and Cleanup Criteria

Part 201 of Michigan's Natural Resources and Environmental Protect Act (NREPA) required the Michigan Department of Environmental Quality (MDEQ) to create cleanup criteria for both residential and nonresidential land uses. Any real estate which has groundwater or soil concentrations (as the result of a release of hazardous substances) above Michigan's Generic Residential Cleanup Criteria is defined as a "facility" under Part 201 unless their presence is the result of naturally occurring conditions. Classification as a "facility" is applied to a site irrespective of the actual site use (residential or non-residential). If a site is found to be a "facility", certain Due Care and investigation obligations apply.

Part 201 of NREPA also requires persons who have knowledge their property is a facility to investigate the nature and extent of chemicals released to the environment. The requirement is not to investigate any or every location, but to investigate areas reasonably known or reasonably expected to have been affected by releases of chemicals. Under most circumstances, Part 201 Section 14a of NREPA authorizes such persons to perform these investigations without notice to the public or the MDEQ. However, prior to performing starting this investigation, R&W and representatives of WWW voluntarily meet with MDEQ to describe the two areas of concern and the proposed investigation. Note that MDEQ suggested, and WWW incorporated, some additional testing into this investigation as a result of the meeting and resulting discussions.

The MDEQ created generic cleanup criteria for both groundwater and soil. MDEQ also establishes generic cleanup criteria based on the method that people or wildlife may be exposed to the chemicals (exposure pathways). For instance, MDEQ created groundwater cleanup criteria based on people drinking the groundwater, people coming into contact with the groundwater, etc. The MDEQ also created groundwater cleanup criteria to protect aquatic organisms which could be exposed to chemicals when groundwater naturally flows into streams and lakes. This is called the groundwater surface water interface (GSI) exposure pathway.

To protect groundwater used for drinking water, the MDEQ established generic groundwater cleanup criteria based on both potential adverse health effects and aesthetics. Therefore, MDEQ establishes generic groundwater cleanup criteria based on both health based and/or aesthetic considerations. The most common aesthetic issue with groundwater in Michigan is the presence of iron. Groundwater in many parts of Michigan, naturally contains iron above the aesthetic cleanup criteria. Iron can cause brown or rust colored stains on plumbing fixtures, clothing, sidewalks or other materials. Not all chemicals have aesthetic generic cleanup criteria.

Exposure pathways are "facility" specific and generic residential cleanup criteria may not be relevant and do not apply to every facility. For example, if public water is available and the current owner/operator prevents the installation of drinking water wells on a facility,

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then cleanup criteria for the drinking water pathway is not relevant and do not apply to that particular facility.

For some chemicals, MDEQ has not established generic cleanup criteria for every exposure pathway. There can be several reasons for this. One is a lack of information concerning how the chemical may affect a person or wildlife, but frequently it is because the chemical is not likely to cause a concern for a given exposure pathway. For instance, certain chemicals are virtually insoluble in water or do not readily migrate from soil to groundwater. Other chemicals are not likely to evaporate and cause a concern for inhalation of air. In these circumstances, MDEQ notes that cleanup criteria for certain exposure pathways are not needed for chemicals having these physical properties.

While the generic residential cleanup criteria are the basis to determine if land is a facility as defined by Part 201 of NREPA, the nonresidential cleanup criteria are appropriate for land which is not used for residential purposes. This site is not used for residential purposes, but Table 1 compares the groundwater test results to the generic residential cleanup criteria for groundwater, in order to determine if the site is a facility. However, for determining environmental response actions, non-residential criteria would be used.

Spring/Summer 2011 Environmental Investigation

The May 2011 investigation involved groundwater. As discussed above the interior of the building was power washed, including the walls and floor prior to demolition. In addition, during demolition, continuous observations were performed to identify areas of potential contamination based on visual observations, the presence of or lack of odors, stained soils, deteriorated floors, and knowledge. Although the breaking of the floors to allow for drainage is a standard demolition practice, in this case it allowed for the observations outlined above to be made for the integrity of the floors and potential odors from beneath the concrete slabs. These observations resulted in the identification of the two areas from which soil was removed. Since no other areas of contamination were identified during the demolition, and the soil was removed from the two areas discussed above, there is no information to indicate any other area of soil contamination. Consequently, the May 2011 investigation did not include soil sampling.

In May 2011, R&W and a drilling subcontractor installed three monitoring wells and five piezometers near the former maintenance area and wastewater treatment area. The monitoring wells were installed to measure groundwater elevations and collect groundwater samples for chemical analysis. The piezometers are wells that are used to measure the groundwater elevations. R&W also surveyed to reference points to measure water elevations at both Rum Creek and the Rogue River. The groundwater elevations were used to create groundwater elevation contour maps which indicate the groundwater flow direction. Refer to Figure 1 for the locations of the monitoring wells, piezometers, groundwater contours, and groundwater flow directions.

The groundwater samples were collected from MW-1 and MW-2 which are in the former WWTP area and MW-3 which is located in the vicinity of former maintenance area. Samples were collected using U.S. Environmental Protection Agency (EPA) and MDEQ-recommended low flow techniques. These sampling methods require field measurement of temperature, conductivity, dissolved oxygen (DO), pH, oxidation/reduction potential

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(ORP, a.k.a. Eh), and turbidity to ensure that the samples collected are representative of the groundwater.

R&W submitted the samples to an independent laboratory, Brighton Analytical, LLC (BAL; Brighton, Michigan) which tested for the presence of volatile organic compounds (VOCs; including gasoline constituents and various solvents [acetone, methyl ethyl ketone, trichloroethylene, etc.]), semi-volatile organic compounds (SVOCs; including various phenolic compounds), formic acid/formate ion, acetic acid/acetate ion, antimony, arsenic, barium, beryllium, boron, cadmium, chromium (hexavalent and total), cobalt, copper, iron, lead, magnesium, molybdenum, nickel, selenium, silver, sodium, thallium, titanium, vanadium, zinc, chloride, cyanide (total), sulfate, sulfide, phosphorus (total), ammonia, nitrite, and nitrate. These specific chemicals were selected based on R&W's extensive knowledge of the former tannery operations and after consultation with MDEQ.

Pathway Evaluation

Since the groundwater vents (flows into) Rum Creek and the Rogue River the GSI pathway is relevant and applicable for the site. However, venting of the groundwater to Rum Creek and the Rouge River limits the migration of groundwater, effectively confining any groundwater contamination to the site. Since no drinking water wells are on the WWW site, the drinking water criteria are not relevant or applicable cleanup criteria.

Part 201 of NREPA includes generic residential cleanup criteria for a number of exposure pathways. For most chemicals, either the drinking water or GSI cleanup criteria are the most restrictive (lowest values). The concentration of chemicals found in the groundwater are well below the generic residential cleanup criteria for these other pathways, and are not included on Table 1.

Findings and Discussion

Based on groundwater contours maps (refer to Figure 1) developed from the May 2011 investigation, the groundwater flows toward both Rum Creek and the Rogue River. Given the size of the Rouge River, it is highly likely that all shallow groundwater from the Site ultimately flows into the Rogue River and/or Rum Creek.

The results of the groundwater testing and generic cleanup criteria described above are summarized on Table 1. Neither VOCs nor SVOCs were present in the groundwater samples above any of the Generic residential cleanup criteria. Similarly, neither formic acid/formate ion nor sulfide were detected in any of the groundwater samples. With the exception of arsenic and iron discussed in the following paragraph, all metals were measured at less than detection limits or cleanup criteria. Hexavalent chromium was not found at concentrations exceeding analytical method detection limits.

The groundwater sample collected from MW-1 contained arsenic above the generic residential cleanup criteria for both the drinking water and GSI pathways. The concentrations of arsenic in samples from MW-2 and MW-3 do not exceed these criteria. Since the drinking water pathway is not relevant or applicable for the site, this arsenic exceedance does not apply. For the GSI exceedance, the additional investigation will further evaluate that pathway.

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Total cyanide was detected in the groundwater samples collected from MW-1 and MW-2. No cyanide was detected in the groundwater sample collected from MW-3. The concentrations of cyanide found in the samples from MW-1 and MW-2 were well below the generic residential cleanup criteria for the drinking water exposure pathway. For the GSI exceedance, the additional investigation will further evaluate that pathway.

The groundwater sample collected from MW-3 contained acetic acid and/or acetate ion above its generic residential cleanup criteria for the drinking water pathway. The groundwater samples collected from MW-1 and MW-2 did not exceed any generic residential cleanup criteria. Since the drinking water pathway is not applicable or relevant, no additional investigation is required for acetic acid/acetate.

The groundwater samples from MW-2 and MW-3 contained iron above its aesthetic but below its health-based drinking water criteria. Sulfate was found in the groundwater sample collected from MW-3 above its aesthetic drinking water criterion, but there is no health-based generic cleanup criteria. The presence of iron and sulfate is not a concern.

Ammonia was detected in all three groundwater samples. For the drinking water pathway, MDEQ adds the total concentrations of ammonia, nitrite, and nitrate (which are all chemical forms of the element nitrogen). The total concentrations of these nitrogen forms in groundwater samples from MW-1 and MW-2 exceed the generic drinking water criteria. The groundwater sample from MW-3 did not exceed the generic drinking water criteria. However, the drinking water pathway is neither relevant nor applicable for the site.

The GSI criteria for ammonia is calculated by using both the pH and temperature of the river water to determine the concentration of "un-ionized" ammonia. The criteria shown on Table 1 are based on using MDEQ's conservative generic assumptions for the pH and temperature of all rivers (i.e. a pH of 8 and 68°F temperature). The calculated concentrations of un-ionized ammonia in the three groundwater samples exceed the generic GSI cleanup criterium. R&W proposes additional investigation pertaining to ammonia.

Additional Investigation

R&W proposes to perform tests to measure the hydraulic conductivity of the soil at MW-1, MW-2, and P-1 through P-4. The hydraulic conductivity is essentially a measure of how easily water flows through the soil. Groundwater elevations will be measured in all monitoring wells and piezometers. This information will be used to calculate the groundwater flow rate and volume moving toward the river/creek. The groundwater flow rate and volume will be combined with information about the Rogue River/Rum Creek to further evaluate arsenic, ammonia, and cyanide. R&W has assembled information about the flow, pH, and temperature of the Rogue River and Rum Creek. This information will be combined with the groundwater flow volume, rate and constituent concentrations to evaluate the GSI pathway.

WWW will obtain additional groundwater samples from MW-1, MW-2, and P-1 through P-4. These samples will be collected using the same procedures described above. The samples will be transported to BAL and tested for ammonia.

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Information about the Rogue River and Rum Creek will be used to calculate the un-ionized ammonia concentrations.


WWW will install two additional groundwater monitoring wells (MW-4 and MW-5) in the area of the former maintenance area to better characterize the groundwater in this area. MW-3 through MW-5 will be sampled and tested for the same list of chemicals analyzed in July 2011.

R&W will prepare an updated letter, tables, figure, and supporting documentation when the additional investigation is complete.

If you have any questions about this investigation, please contact me.

Sincerely,

ROSE & WESTRA, INC.



Mark A. Westra

maw/mjk

enc (2): Figure 1 and Table 1

via e-mail and UPS delivery

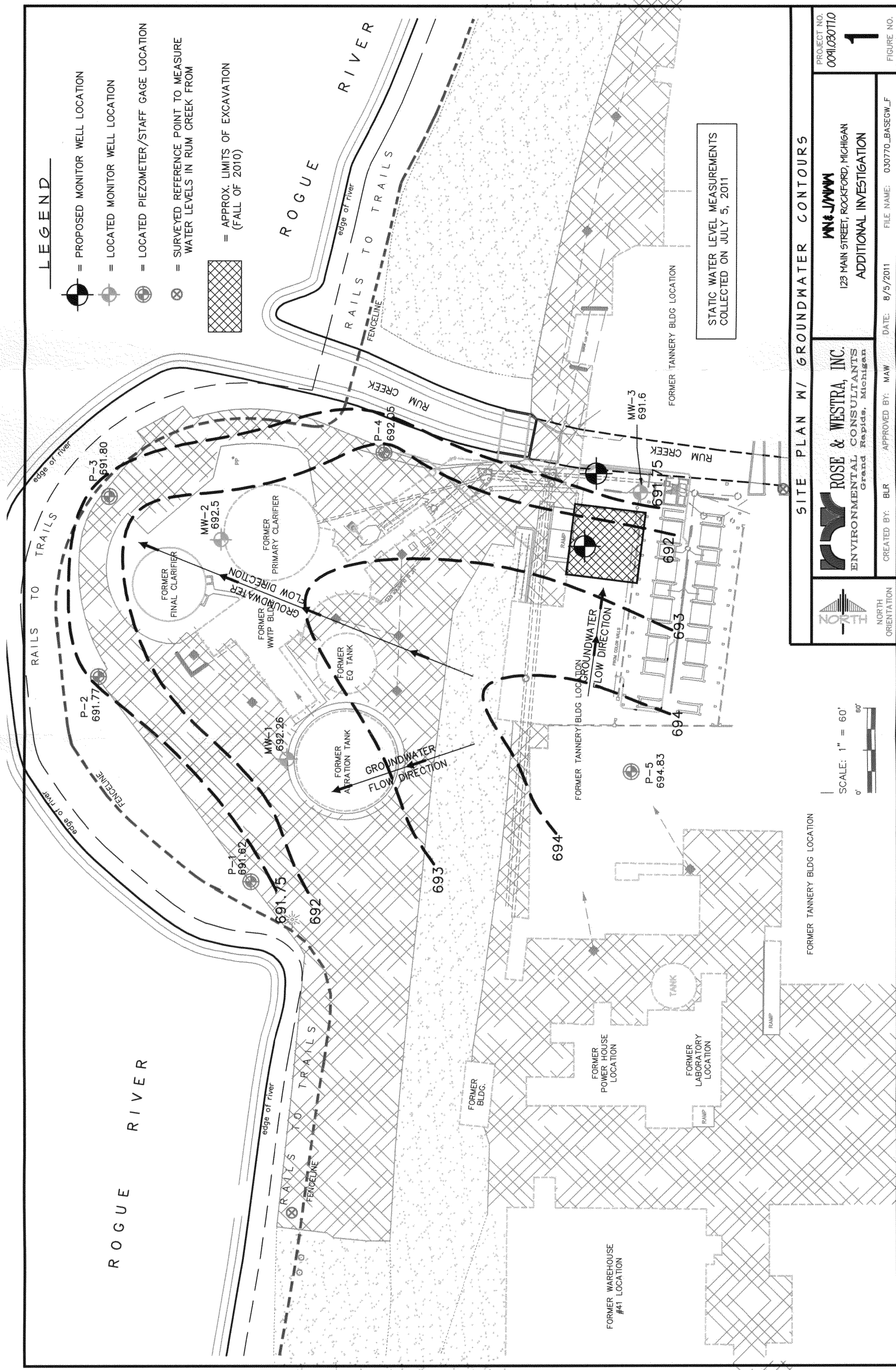
cc/enc: Mr. John Pawlowski • MDEQ (three copies)


Mr. Michael Robinson • Warner Norcross & Judd LLP

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ENCLOSURE 1

FIGURE 1



 ROSE & WESTRA, INC. ENVIRONMENTAL CONSULTANTS Grand Rapids, Michigan	WWS/JWW 123 MAIN STREET, ROCKFORD, MICHIGAN ADDITIONAL INVESTIGATION	PROJECT NO. 0001.030711.0
	FIGURE NO. 1	
SITE PLAN W/ GROUNDWATER CONTOURS		FILE NAME: 030770_BASEGW_LF
CREATED BY: BLR	APPROVED BY: MAW	DATE: 8/5/2011

ENCLOSURE 2

TABLE 1

TABLE 1
SUMMARY OF GROUNDWATER QUALITY DATA
July 2011
123 North Main Street, Rockford, Michigan

Chemical	Chemical Abstract Service (CAS) Number	Residential Drinking Water Criteria (DWC)	Non Residential Drinking Water Criteria (DWPC)	Groundwater Surface Water Interface Criteria (GSIC)	MW-1 7/5/2011	MW-2 7/5/2011	MW-3 7/5/2011
Metals	Antimony	6.0 (A)	6.0 (A)	130 (X)	<2.0	<2.0	<2.0
	Arsenic (B)	10 (A)	10 (A)	10	37	6	<1.0
	Barium (B)	2,000 (A)	2,000 (A)	1.6E+5 (G)	<100	100	<100
	Beryllium	4.0 (A)	4.0 (A)	1200 (G)	<1.0	<1.0	<1.0
	Boron (B)	500 (F)	500 (F)	5,000 (X)	100	310	320
	Cadmium (B)	5.0 (A)	5.0 (A)	130 (G,X)	<0.2	<0.2	<0.2
	Cadmium (VI)	100 (A)	100 (A)	11	<5.0	<5.0	<5.0
	Chromium (total) (B,H)	100 (A)	100 (A)	NA	<5.0	<5.0	<5.0
	Cobalt	40	100	100	<10	<10	<10
	Copper (B)	1,000 (E)	1,000 (E)	64,000 (G)	<4.0	<4.0	<4.0
	Iron (B)	300 (E)	300 (E)	NA	100	430	920
	Lead (B) - Total	4.0 (L)	4.0 (L)	190 (G,X)	<3.0	<3.0	<3.0
	Magnesium (B)	4.0E+5	1.1E+6	NA	2,000	4,100	26,000
	Mercury (total) (B,Z)	2.0 (A)	2.0 (A)	0.0013	<0.2	<0.2	<0.2
	Molybdenum (B)	73	210	3,200 (X)	10	<10	<10
	Nickel (B)	100 (A)	100 (A)	73 (G)	<20	<20	<20
	Selenium (B)	50 (A)	50 (A)	5	<5	<5	<5
	Silver (B)	34	98	0.2 (M); 0.06	<0.2	<0.2	<0.2
	Sodium	1.2E+5	3.5E+5	NA	48,000	87,000	92,000
	Thallium (B)	2.0 (A)	2.0 (A)	3.7 (X)	<2.0	<2.0	<2.0
	Titanium	NA	NA	NA	<200	<200	<200
SVOCs	Vanadium	4.5	62	12	<4.0	<4.0	<4.0
	Zinc (B)	2,400	5,000 (E)	22,000 (G)	10	<10	20
Other	Phenol	4,400	13,000	450	25	<5.0	<5.0
	Ammonia	10,000 (N)	10,000 (N)	(CC)	14,000	20,000	1,500
	Unionized Ammonia - Calculation (assumes 20C)	NA	NA	(GG)	534	764	57
	Nitrate (B,N)	10,000 (A,N)	10,000 (A,N)	ID	<50	<50	1,500
	Nitrite (B,N)	1,000 (A,N)	1,000 (A,N)	NA	<50	<50	110
	Chloride	2.5E+5 (E)	2.5E+5 (E)	(FF)	86,000	39,000	50,000
	Phosphorus (Total)	63,000	2,40E+05	(EE)	890	750	70
	Sulfate	2.5E+5 (E)	2.5E+5 (E)	NA	36,000	86,000	930,000
	Sulfide	NA	NA	NA	<200	<200	<200
	Cyanide, total (P,R)	200 (A)	200 (A)	NA	7	7	<5
	Cyanide, reactive or amenable	NA	NA	5.2	NT	NT	NT
	Acetic Acid/Acetate	4,200	12,000	10,000 (G)	2,600	2,000	6,000
	Formic Acid/Formate [U.I]**	10,000	29,000	ID	<100	<100	<100
	2-Butanone (MEK) (I)	13,000	38,000	2,200	21	<5.0	<5.0
	4-Methyl-2-pentanone (MIBK) (I)	1,800	5,200	ID	19	<5	<5
VOCs	Acetone (I)	730	2,100	1,700	53	<20	<20

TABLE 1
SUMMARY OF GROUNDWATER QUALITY DATA
July 2011
123 North Main Street, Rockford, Michigan

Notes :

All units in ug/L (parts per billion).

Only the hazardous substances with concentrations above their method detection limits are shown. Please refer to the analytical results for further information.

A summary of the footnotes and abbreviations used in this table can be found in Table A.

For complete definitions of the footnotes used in this table see R 299.5750 of the Michigan Administrative Code.

<u>Underline</u>	= Value exceeds the Residential Drinking Water Protection Criteria.
<i>Italics</i>	= Value exceeds the Non Residential Drinking Water Protection Criteria.
Bold	= Value exceeds the Groundwater Surface Water Interface Protection Criteria.
*	= CAS number for sodium sulfide
**	= Criteria for Formic Acid
NT	= Not Tested
< XXX	= The concentration of the hazardous substance does not exceed its method detection limit (XXX).
ID	= Insufficient data to develop criterion.
NA	= Criterion or value is not available or not applicable.
(A)	= Criterion is the state of Michigan drinking water standard established pursuant to section 5 of 1976 PA 399, MCL 325.1005.
(B)	= Background, as defined in R 299.5701(b), may be substituted if higher than the calculated cleanup criterion.
(E)	= Criterion is the aesthetic drinking water value, as required by section 20120a(5) of the Act. For iron, the health based values for residential and nonresidential are 2,000 and 5,600 µg/L, respectively. There are no health based criteria for sulfate.
(F)	= Criterion is based on adverse impacts to plant life and phytotoxicity.
(G)	= Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. A hardness of 150 mg CaCO ₃ /L or pH of 8 SU was used to calculate this criteria.
(I)	= Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001).
(L)	= Criteria for lead are derived using a biologically based model, as allowed for under section 20120a(10) of the act, and are not calculated using the algorithms and assumptions specified in pathway-specific rules.
(M)	= Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
(N)	= The concentrations of all potential sources of nitrate-nitrogen (e.g., ammonia-N, nitrite-N, nitrate-N) in groundwater that is used as a source of drinking water shall not, when added together, exceed the nitrate drinking water criterion of 10,000 ug/l.
(N)	= Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 ug/kg.
(X)	= The groundwater surface water interface (GSI) criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source.
(CC)	= The GSI criterion shall be compared to the percent of the total ammonia concentration in the groundwater that will become NH ₃ in the surface water. This
(EE)	= See R 299.5750 of the Michigan Administrative Code for details.
(FF)	= The chloride groundwater surface water interface criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.
(GG)	= Unionized ammonia values calculated from Part 31, Rule 57 table using MDEQ default assumptions, i.e., receiving stream pH = 8, and temperature = 68°F.